

**Amendments to the Claims:**

This listing of Claims will replace all prior versions and listings of Claims in the application.

**Listing of the Claims:**

1. (Four Times Amended) In an aerobic wastewater treatment plant comprising:  
a vessel defining an aeration chamber and having a substantially flat bottom wall and a substantially cylindrical side wall,  
said aeration chamber containing aerobic bacteria into which wastewater containing organic solids flows to be exposed to aerobic bacteria to [convert] aerobically digest the organic solids in the wastewater [to water and CO<sub>2</sub>, said aeration chamber having a bottom and side walls],  
[means for injecting an oxygenation gas into the wastewater]  
an aeration system in the aeration chamber to support growth of the aerobic bacteria, and  
a clarifier chamber formed in said vessel and into which wastewater from the aeration chamber flows upwardly toward an outlet pipe through which the wastewater flows from the wastewater treatment plant, said clarifier chamber being defined by a partition in the form of an inverted, truncated cone into the bottom of which the wastewater flows from the aeration chamber,  
the improvement [comprising a diffuser for releasing the oxygenation gas as bubbles into the]  
wherein said aeration [chamber of the wastewater treatment plant,] system forms an aeration area adjacent the intersection of the bottom and side wall of the vessel and [said diffuser providing] provides sufficient flow such that all solids suspended within the plant are forced into circulation, said [diffuser being placed close to the bottom of the aeration chamber of the wastewater treatment plant and close to the side wall of the aeration chamber,] aeration system [said diffuser] providing sufficient oxygenation gas to allow the aerobic bacteria to [convert] digest the organic solids in the

wastewater [into CO<sub>2</sub> and water.] and a current pattern having at least one first component flowing upwardly in a direction perpendicular to the bottom wall of the vessel and adjacent to the side wall of the vessel, second and third components that flow in opposite directions around the partition which defines the clarifier chamber, a fourth component that flows along said side wall opposite said first component to the bottom, a fifth component that flows across the bottom under the opening to the clarifier chamber, and sixth and seventh components that flow in opposite directions adjacent the bottom wall of the vessel, said current pattern being such that wastewater in said clarifier chamber remains largely undisturbed.

2. (Cancelled)

3. (Cancelled)

4. (Twice Amended) The wastewater treatment plant of Claim 3 wherein said [oxygenation gas injecting means] aeration system further comprises:

a drop line having a first end attached to an external oxygenation source and a second end open to dispense oxygenation gas received from [the] an external oxygenation gas source, [said second end being attached to said diffuser] into said aeration area.

5. (Twice Amended) The wastewater treatment plant of Claim 4 wherein said [oxygenation gas injecting means] aeration system further comprises

a rigid conduit mounted to the inside of the [wastewater treatment plant] vessel for receiving and firmly securing the drop line such that the drop line extends from the oxygenation source towards the bottom wall of the [plant] vessel.

6. (Currently Amended) The wastewater treatment plant of Claim 5 wherein said rigid conduit extends generally parallel to the partition and from there generally to the bottom wall of the

[wastewater treatment plant] vessel such that the rigid conduit is intimately connected to the partition.

7. **(Four Times Amended)** In an aerobic wastewater treatment plant comprising:  
a vessel having a substantially flat, bottom wall and a substantially cylindrical side wall and  
defining an aeration chamber into which the wastewater flows to be exposed to aerobic bacteria to  
[convert] aerobically digest the organic solids in the wastewater [to water and CO<sub>2</sub>, said aeration  
chamber having a bottom and side walls,]

[means for injecting an oxygenation gas into the wastewater in the aeration chamber to  
support growth of the aerobic bacteria], and

a clarifier chamber in which wastewater from the aeration chamber flows upwardly toward  
an outlet pipe through which the wastewater flows from the wastewater treatment plant, said clarifier  
chamber being defined by a partition disposed in said vessel, said partition being in the form of an  
inverted, truncated cone into the bottom of which the wastewater flows from the aeration chamber,

the improvement comprising means for injecting an oxygenation gas and generating a  
wastewater current pattern in the aeration chamber[,]  
from an aeration area [the current flowing  
upwardly from a position] close to the bottom and the side wall of the [aeration chamber] vessel, the  
current pattern having at least one first component flowing upwardly in a direction perpendicular to  
the bottom wall of the vessel [aeration chamber] and [parallel to] adjacent the side wall of the vessel  
[aeration chamber], second and third components that flow in opposite directions [then] around the  
partition which defines the clarifier chamber, a fourth component that flows [then downwardly]  
along [the] said side wall opposite [side wall] said first component to the bottom of the aeration  
chamber, a fifth component that flows [and then] across the bottom under the opening to the clarifier

chamber and sixth and seventh components that flow in opposite directions [and] around the side wall of the vessel [aeration chamber] adjacent the bottom wall of the [chamber] vessel to keep solids from settling on the bottom of the aeration chamber.

8. **(Thrice Amended)** The method of creating a current pattern inside an aeration chamber of a wastewater treatment plant, said aeration chamber having a bottom and side walls, comprising the step of

injecting an oxygenation gas such that a current pattern is produced in the aeration chamber, the current pattern having a first component flowing upwardly from a position close to the bottom and side wall of the aeration chamber in a direction perpendicular to the bottom of the aeration chamber and parallel to the side wall of the aeration chamber, [then] first and second components flowing in opposite directions around the partition which defines a clarifier chamber, [then] a third component flowing downwardly along the opposite side wall to the bottom [and then], a fourth component flowing across the bottom under an opening to the clarifier chamber, and fifth and sixth components flowing in opposite directions around the side wall of the aeration chamber adjacent the bottom of the aeration chamber to keep solids from settling on the bottom of the aeration chamber.

9. **(Four Times Amended)** An aerobic wastewater treatment plant comprising:  
an aeration chamber containing aerobic bacteria into which wastewater [containing organic solids] flows to be exposed to aerobic bacteria to [convert] digest the organic solids in the wastewater [to water and CO<sub>2</sub>], said aeration chamber having a substantially flat, bottom wall and a substantially cylindrical side wall[s],

[means for injecting an oxygenation gas into the wastewater in the aeration chamber to support growth of the aerobic bacteria,]

a clarifier chamber into which wastewater from the aeration chamber flows upwardly toward an outlet pipe through which the wastewater flows from the wastewater treatment plant, said clarifier chamber being defined by a partition in the form of an inverted, truncated cone into the bottom of which the wastewater flows from the aeration chamber, said bottom wall providing a substantially planar surface under said partition.

[a diffuser] an aeration system for releasing an [the] oxygenation gas as bubbles into the aeration chamber of the wastewater treatment plant, said aeration system [diffuser] providing an aeration area and sufficient flow such that all solids suspended within the plant are forced into [circulation] a circulation pattern, said [diffuser] aeration system being placed close to the bottom of the aeration chamber of the wastewater treatment plant and close to the side wall of the aeration chamber, said [diffuser] aeration system providing sufficient oxygenation gas to allow the aerobic bacteria to [convert] digest the solids in the wastewater [into CO<sub>2</sub> and water.] and a current pattern having at least one first component flowing upwardly in a direction perpendicular to the bottom wall of the vessel and adjacent the side wall of the vessel, second and third components that flow in opposite directions around the partition which defines the clarifier chamber, a fourth component that flows along said side wall opposite said first component to the bottom, a fifth component that flows across the bottom under the opening to the clarifier chamber, and sixth and seventh components that flow in opposite directions adjacent the bottom wall of the vessel.

10. **(Four Times Amended)** An aerobic wastewater treatment plant comprising:

an aeration chamber into which the wastewater flows to be exposed to aerobic bacteria to aerobically digest [convert] the organic solids in the wastewater [to water and CO<sub>2</sub>], said aeration chamber having a substantially flat, bottom wall and a substantially cylindrical side wall[s],

[means for injecting an oxygenation gas into the wastewater in the aeration chamber to support growth of the aerobic bacteria,]

a clarifier chamber in which wastewater from the aeration chamber flows upwardly toward an outlet pipe through which the wastewater flows from the wastewater treatment plant, said clarifier chamber being defined by a partition in the form of an inverted, truncated cone into the bottom of which the wastewater flows from the aeration chamber, and

[a current in the aeration chamber, the current flowing upwardly from a position close to the bottom and the side wall of the aeration chamber in a direction perpendicular to the bottom of the aeration chamber and parallel to the side wall of the aeration chamber, then around the partition which defines the clarifier chamber, then downwardly along the opposite side wall to the bottom and then across the bottom under the opening to the clarifier chamber and around the side wall of the aeration chamber adjacent the bottom of the chamber to keep solids from settling on the bottom of the aeration chamber.]

means for injecting an oxygenation gas and generating a wastewater current pattern in the aeration chamber, the current pattern having at least one first component flowing upwardly in a direction perpendicular to the bottom of the aeration chamber and adjacent the side wall of the aeration chamber, second and third components that flow in opposite directions around the partition which defines the clarifier chamber, a fourth component that flows downwardly along the opposite side wall to the bottom, a fifth component that flows across the bottom under the opening to the clarifier chamber, and sixth and seventh components that flow in opposite directions around the side wall of the aeration chamber adjacent the bottom of the chamber to keep solids from settling on the bottom of the aeration chamber.

11-16. (Cancelled)

17. (New) The wastewater treatment plant of Claim 1 wherein said aeration system comprises multiple diffusers.

18. (Cancelled)

19. (Cancelled)

20. (New) The method of Claim 8 wherein injection of said oxygenation gas is through a diffuser system.

21. (New) The method of Claim 20 wherein injection of said oxygenation gas is through multiple diffusers.

22. (New) The wastewater treatment plant of Claim 9 wherein said aeration system comprises multiple diffusers.

23. (New) The wastewater treatment plant of Claim 10 wherein said means for generating said current pattern comprises a diffuser system.

24. (New) The wastewater treatment plant of Claim 23 wherein said diffuser system comprises multiple diffusers.

25. (New) In an aerobic wastewater treatment plant comprising:  
an aeration chamber containing aerobic bacteria into which wastewater containing organic solids flows to be exposed to aerobic bacteria to digest the organic solids in the wastewater, said aeration chamber having a substantially flat bottom and side walls,

means for injecting an oxygenation gas into the wastewater in the aeration chamber to support growth of the aerobic bacteria, and

a clarifier chamber into which wastewater from the aeration chamber flows upwardly toward an outlet pipe through which the wastewater flows from the wastewater treatment plant, said clarifier chamber being defined by a partition in the form of an inverted, truncated cone into the bottom of which the wastewater flows from the aeration chamber,

the improvement comprising a diffuser for releasing the oxygenation gas as bubbles into the aeration chamber of the wastewater treatment plant, said diffuser providing sufficient flow such that all solids suspended within the plant are forced into circulation, said diffuser being placed close to the bottom of the aeration chamber of the wastewater treatment plant and close to the side wall of the aeration chamber, said diffuser providing sufficient oxygenation gas to aerobically digest the organic solids in the wastewater, the released oxygenation gas producing a current pattern in the aeration chamber, the current pattern flowing upwardly from a position of the diffuser in a direction perpendicular to the bottom of the aeration chamber and parallel to the side wall of the aeration chamber, then around the partition which defines the clarifier chamber, then downwardly along the opposite side wall to the bottom and then across the bottom under the opening to the clarifier chamber and around the side wall of the aeration chamber adjacent the bottom of the chamber to keep solids from settling on the bottom of the aeration chamber.

26. (New) The wastewater treatment plant of Claim 25 wherein said oxygenation gas injecting means further comprises

a drop line having a first end attached to an external oxygenation source and a second end open to dispense oxygenation gas received from the external oxygenation gas source, said second end being attached to said diffuser.



27. (New) The wastewater treatment plant of Claim 26 wherein said oxygenation gas injecting means further comprises

a rigid conduit mounted to the inside of the wastewater treatment plant for receiving and firmly securing the drop line such that the drop line extends from the oxygenation source towards the bottom of the plant.

28. (New) The wastewater treatment plant of Claim 27 wherein said rigid conduit extends generally parallel to the partition and from there generally to the bottom of the wastewater treatment plant such that the rigid conduit is intimately connected to the partition.

29. (New) In an aerobic wastewater treatment plant comprising:  
an aeration chamber into which the wastewater flows to be exposed to aerobic bacteria to digest the organic solids in the wastewater, said aeration chamber having a bottom and side walls,  
means for injecting an oxygenation gas into the wastewater in the aeration chamber to support growth of the aerobic bacteria, and

a clarifier chamber in which wastewater from the aeration chamber flows upwardly toward an outlet pipe through which the wastewater flows from the wastewater treatment plant, said clarifier chamber being defined by a partition in the form of an inverted, truncated cone into the bottom of which the wastewater flows from the aeration chamber,

the improvement comprising a current pattern produced in the aeration chamber, the current pattern flowing upwardly from a position close to the bottom and the side wall of the aeration chamber in a direction perpendicular to the bottom of the aeration chamber and parallel to the side wall of the aeration chamber, the around the partition which defines the clarifier chamber, then downwardly along the opposite side wall to the bottom and then across the bottom under the opening

to the clarifier chamber and around the side wall of the aeration chamber adjacent the bottom of the chamber to keep solids from settling on the bottom of the aeration chamber.

30. (New) The method of creating a current inside an aeration chamber of a wastewater treatment plant, said aeration chamber having a bottom and side walls, comprising

injecting an oxygenation gas such that a current pattern is produced in the aeration chamber, the current pattern flowing upwardly from a position close to the bottom and side wall of the aeration chamber in a direction perpendicular to the bottom of the aeration chamber and parallel to the side wall of the aeration chamber, then around the partition which defines a clarifier chamber, then downwardly along the opposite side wall to the bottom and then across the bottom under an opening to the clarifier chamber and around the side wall of the aeration chamber adjacent the bottom of the aeration chamber to keep solids from settling on the bottom of the aeration chamber.

31. (New) An aerobic wastewater treatment plant comprising:

an aeration chamber into which the wastewater flows to be exposed to aerobic bacteria to digest the organic solids in the wastewater, said aeration chamber having a bottom and side walls, means for injecting an oxygenation gas into the wastewater in the aeration chamber to support growth of the aerobic bacteria,

a clarifier chamber in which wastewater from the aeration chamber flows upwardly toward an outlet pipe through which the wastewater flows from the wastewater treatment plant, said clarifier chamber being defined by a partition in the form of an inverted, truncated cone into the bottom of which the wastewater flows from the aeration chamber, and

a current pattern in the aeration chamber, the current pattern flowing upwardly from a position close to the bottom and the side wall of the aeration chamber in a direction perpendicular

to the bottom of the aeration chamber and parallel to the side wall of the aeration chamber, then around the partition which defines the clarifier chamber, then downwardly along the opposite side wall to the bottom and then across the bottom under the opening to the clarifier chamber and around the side wall of the aeration chamber adjacent the bottom of the chamber to keep solids from settling on the bottom of the aeration chamber.

32. (New) The wastewater treatment plant of Claim 7 wherein said means for injecting comprises an injection system for creating an injection area adjacent to the intersection of said side wall and said bottom wall.

33. (New) The wastewater treatment plant of Claim 32 wherein said injection system comprises multiple diffusers.